DIAGNOSTIC STUDY OF KOONTZ LAKE INDIANA

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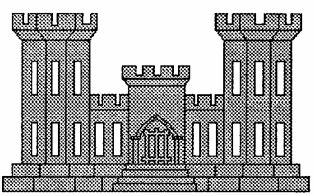

PREPARED FOR:

U.S. ARMY CORPS OF ENGINEERS,
DETROIT DISTRICT
ENGINEERING AND PLANNING DIVISION
ENVIRONMENTAL ANALYSIS BRANCH

OCTOBER 1999

SEG
Engineers • Scientists • Planners

DIAGNOSTIC STUDY
OF
KOONTZ LAKE, INDIANA

Draft Report

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DETROIT DISTRICT
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ENVIRONMENTAL ANALYSIS BRANCH
P.O. BOX 1027
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PREPARED BY:

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OCTOBER 1999

1.0 INTRODUCTION

Snell Environmental Group, Inc. (SEG) was contracted by the U.S. Army Corps of Engineers, Detroit District (COE) to conduct a diagnostic study of Koontz Lake located in Starke and Marshal Counties, Indiana (Figure 1). Sampling occurred September 20-22, 1999. Water, sediment, plankton, vegetation, and fish were collected and analyzed from multiple stations within Koontz Lake to assess the chemical and biological status of the lake.

2.0 METHODS

This section describes sampling materials and methods used to collect water, sediment, plankton, vegetation, and fish, as described in the Scope of Work.

2.1 Sediment Sampling

A total of 18 sediment samples were collected from Koontz Lake on September 20, 1999 for total phosphorus analysis (Figure 2). Three (3) additional sediment samples were collected from sample stations KL9901, KL9910, and KL9918 for particle size distribution analysis. Sampling stations were located using a site location map and landmarks. The coordinates of each sampling station were recorded with a real-time differentially corrected Global Positioning System (GPS). The water depth of each sampling station was recorded with an on-board depth finder.

At each sampling station, a petite ponar sampler was lowered to the bottom of the lake and a sediment sample was collected. The sample was transferred to a stainless steel bucket, aquatic vegetation was removed, and the sediment was mixed to obtain a representative sample. A photograph was taken of each representative sediment type. A physical description of the sample including sediment texture and color, organic constituents, and presence/absence of sediment odors was recorded. Samples collected for phosphorus analysis were transferred into precleaned glass jars using a stainless steel spoon. Samples collected for particle size distribution were transferred into plastic containers. After the sample was retrieved at each station, the spoon, bucket, and ponar grab were rinsed with lake water. All sediment samples were placed in an ice-filled cooler and transported to DLZ Laboratories, Inc. for analysis.

2.2 Water Sampling

Water samples were collected at mid-depth from Koontz Lake on September 21, 1999 at all sampling stations except KL9910. Samples at KL9910 were collected from 3 feet below the surface and 3 feet above the lake bottom (Figure 2). Water samples were collected and analyzed for nutrients kit (TKN, TON, and NH_4), chlorophyll-A, and orthophosphate.

Sampling stations were located using GPS coordinates recorded during sediment sampling activities. All water samples were collected using a Kemmerer bottle at the appropriate depth. Water samples to be analyzed for total organic nitrogen and nutrients kit were placed into 950 ml plastic bottles containing sulfuric acid (a preservative), placed in an ice-filled cooler, and transported to DLZ Laboratories, Inc. Water samples to be analyzed for chlorophyll-A were placed in 250 ml plastic bottles, placed in an ice-filled cooler, and mailed overnight to Microbiological Associates, Inc. Water samples to be analyzed for orthophosphate were filtered through 0.45 μm membrane filters into 500 ml plastic containers. A new syringe and filter were used for each sample. Orthophosphate samples were placed in an ice-filled cooler and sent via overnight mail to DLZ Laboratories, Inc.

In situ water quality analyses were conducted using a Hydrolab® water quality meter and a Secchi disk. The Hydrolab® was calibrated prior to sampling according to manufacturer's specifications. The Secchi disk was lowered into the water on the shaded side of the boat at each station until it was no longer visible, and the depth was recorded. At each station, a water sample was obtained at mid-depth using a Kemmerer bottle. At station KL9910, samples were obtained at 3 foot intervals. Each water sample was placed into a collection cup that attached to the Hydrolab® such that all probes were immersed in the water sample. The Hydrolab® meter simultaneously read pH, temperature, specific conductivity, dissolved oxygen, and percent oxygen saturation. However, the turbidity probe malfunctioned and did not produce results. Upon reaching site KL9910, the Hydrolab® malfunctioned. As a result of the malfunction, no water quality results were recorded for sites KL9901 through KL9910.

SEG field staff determined that pH, specific conductivity, and turbidity could be determined in the office from water samples collected for total organic nitrogen/nutrients kit. Water samples were collected at 3-foot intervals at station KL9910, transported to SEG, and were analyzed for pH, specific conductivity, and turbidity within holding times. A calibrated Orbeco-Hellige Portable Turbidimeter was used to analyze turbidity and a calibrated Extech Instruments water quality meter was used to analyze pH and specific conductivity.

Light penetration was not recorded for any station as described in the provided scope of services. SEG had arranged for a light meter to be included on the Hydrolab® gang probe, however, the inclusion of the light probe was not possible at the time of sampling.

2.3 Plankton Sampling

Plankton samples were collected from three (3) sampling locations (P1, KLTRAN5, and KL9910) in Koontz Lake on September 21, 1999 (Figure 2).

Sampling stations were located using previously recorded GPS coordinates. At sampling stations P1 and KLTRAN5, samples were collected by taking a vertical 5-foot tow with a Birge-style closing net (63 micron mesh). Duplicate tows were also taken from sampling stations P1 and KLTRAN5 (designated P1-2 and KLTRAN5-2). At station KL9910, the first vertical tow was collected from 5 feet to 0 feet. The second vertical tow was collected from 20 feet to 0 feet and was designated KL9910-2.

The plankton net (12 cm diameter opening) was lowered into the water to the appropriate depth and slowly raised through the water and into the boat. The mesh trap was detached, held over a funnel placed in a plastic sample bottle, and rinsed through the mesh with lake water. Glutaraldehyde preservative were added to each sample. Samples were placed in an ice-filled cooler and transported to SEG.

Samples were shipped via overnight mail to PhycoTech, Inc. for total zooplankton, total phytoplankton, and percent blue-green algae analysis. PhycoTech, Inc. employed a random field count method to examine samples. See appendix A for plankton sampling results.

2.4 Aquatic Vegetation Sampling

Aquatic vegetation was sampled and identified along 5 transects in Koontz Lake on September 20, 1999 (Figure 3). Transects were located using landmarks, a site location map, and specified depth intervals. KLTRAN1 (running northeast). KLTRAN3 (running north), and KLTRAN5 (running north-northwest) spanned water depths beginning at 3 feet and ending at less than 3 feet. KLTRAN2 began in 3 feet of water and continued northwest until the water depth reached 7 feet. KLTRAN4 began in 3 feet of water and continued east until the water depth reached 7 feet. Beginning and ending coordinates were recorded using GPS.

Vegetative sampling was conducted by throwing a grappling hook into the water and retrieving vegetation during a slow troll through the transect. All vegetation was removed from the grappling hook after each throw and identified or taken from the field and identified using Prescott (1980).

2.5 Fish Sampling

Fish were sampled at stations KL9903, KL9904, KL9909, KL9912, KL9915, and KL9917 (Figure 2). Sampling stations were located using landmarks and a site location map. Coordinates were recorded using GPS. Fyke nets were set on the morning of September 20, 1999. Nets consisted of a set of 3 foot diameter hoops with two 8 foot leads. The "pot" end of the net was marked with a buoy and tied to a cinder block or anchor. Each lead was marked with a buoy and tied to a

weight or cinderblock. Leads were adjusted as necessary so that a 90° angle was formed.

Fyke nets were retrieved approximately 23 hours later on September 21, 1999. All fish were immediately removed from the "pot" and placed into a live well. Each fish was weighed, measured for length, and identified to species following Hubbs and Lagler (1958). Representative specimens of each species were photographed. (Appendix B) All fish were returned alive to the water.

2.6 Quality Control/Quality Assurance

Field logs (data sheets) were completed on-site for each sampling station and sampling event. Information recorded included sampling station name and geographical coordinates, time and date of sampling, site depth, sampling equipment, and additional sampling-specific information. Weather observations were recorded for each sampling date.

Chain-of-custody forms were completed for all sediment, water, and plankton samples collected. In addition, all sample bottles and lids were labeled with the collection date, time, site name, and collector's initials.

3.0 RESULTS

The following section describes results of the Koontz Lake Diagnostic Study. The attached analytical data present results from laboratory sediment analyses and water quality analyses.

Weather conditions from September 20-22, 1999 did not interfere with sampling procedures. Observed wind speed ranged from 0 to 15 mph. Temperature ranged from 48 to 65 °F. The lake received no precipitation, and cloud cover varied from 0 to 80%.

3.1 Sediment Sampling

Approximately 72% of the sediment samples distributed throughout the lake (13/18 samples) contained brown silt with medium to high organic content (Table 1). Additional sediment types included black silt and gray sand. Numerous sediment samples also contained a strong hydrogen sulfide odor. These samples were located primarily at the western side of the lake at sites KL9911 through KL9918. Organic materials noted included filamentous algae, snail shells (family Planorbidae), macrophyte fragments (*Chara* sp.), and detritus. Analytical results for sediment collected from Koontz Lake are included in Appendix C.

3.2 Water Sampling

Secchi disk readings were fairly uniform throughout all sampling locations. The depth at which loss of visibility occurred ranged from 2.5 to 3.5 feet below the water surface (Table 2).

The pH of surface water collected from Koontz Lake ranged from 8.38 to 8.72 (Table 2) and was generally higher at western sampling stations. Site KL9910, in which samples were taken at 3-foot intervals, decreased as the depth increased.

Specific conductivity ranged from 22 to 30 mS/cm, with an average of 26.8 (Table 2). A slight increase in specific conductivity was noted in the western portions of Koontz Lake. Specific conductivity at site KL9910 ranged from 28 to 30 mS/cm.

Turbidity ranged from 8.38 to 8.72 NTU, excluding site KL9910 (Table 2). Turbidity at site KL9910 ranged from 2.59 to 5.76 NTU. No trends in turbidity were evident.

Chlorophyll-A concentrations ranged from less than 0.1 ug/L to 50 ug/L (Table 2). Elevated Chlorophyll-A concentrations were generally detected in the western portion of the lake.

Organic nitrogen and total Kjeldahl nitrogen results indicated a similar trend of generally elevated levels of nutrients in the western portions of Koontz Lake (Table 2).

Readings obtained by the Hydrolab® (8 sites) included temperature, dissolved oxygen, and oxygen saturation (Table 2). Temperature varied from 18.8 to 19.6 °C. Dissolved oxygen concentrations ranged from 8.73 to 9.50 mg/L. Oxygen saturation ranged from 84.4 to 95.6%. No trends in temperature, dissolved oxygen, or oxygen saturation were evident. Analytical results for water collected from Koontz Lake are included in Appendix C.

3.3 Plankton Sampling

Plankton sampling results varied substantially between sites (Table 3). Total zooplanktonic organisms per liter ranged from 442.3 for sample P1-1 to 117.8 for sample KL9910-2. Dr. St. Amand of Phycotech, Inc. indicated a non-random distribution of zooplankton is not unusual and is the likely cause of differences in observed zooplankton densities.

Algae community composition appears to be consistent between sites KLTRAN5 and P1. Algal densities at Station KL9910 were substantially lower that the other plankton sampling stations. Blue-green algae (Class Cyanophyceae) comprised between 84.4 and 94.9 percent of the total algal population. The high percentage

of blue-green algae tends to indicate that excess nutrients are available to the biota of Koontz Lake

3.4 Aquatic Vegetation Sampling

Milfoil species (*Myriophyllum* sp.) dominated all sampling stations where plants were present (Table 4). Milfoil patches were found at water depths of 3 feet (at the beginning of the sampling transect) to 6 feet. Filamentous algae dominated at water depths greater than 6 feet. In addition to milfoil, only three other plant species were collected: water-celery (*Vallisneria americana*), pondweed (*Potamogeton* sp.), and muskgrass (*Chara* sp.). No threatened, endangered, or rare plant species were collected (Indiana Department of Natural Resources 1990).

3.5 Fish Sampling

A total of 39 total fish representing 9 species were collected from Koontz Lake (Table 5). Black crappie (*Poxomis nigromaculatus*) dominated the catch (33.3%), followed by pumpkinseed sunfish (*Lepomis gibbosus*, 17.9%), bluegill (*Lepomis macrochirus*, 12.8%), and black bullhead (*Ameiurus melas*, 12.8%).

Netting locations varied with respect to the presence and quantity of vegetation. No relationship was observed between total fish captured and net placement (high vegetation or low vegetation). No physical abnormalities were observed on collected fish.

4.0 CONCLUSIONS

Sediment, water, plankton, vegetation, and fish were surveyed from 18 sampling stations as part of a diagnostic study of Koontz Lake, Indiana. Sampling results suggest that the lake has received excess nutrients that have altered the lake's biological and chemical composition. The western portion of the lake appears to be more impacted by nutrients than eastern portions of the lake. Specific nutrient sources impacting Koontz Lake are not identifiable from data gathered during this diagnostic study, however, failing septic systems of lakeshore homes, nutrient additions for lawn care, and inputs from the upstream watershed are likely contributors to the elevated nutrient levels of the lake.

5.0 LITERATURE CITED

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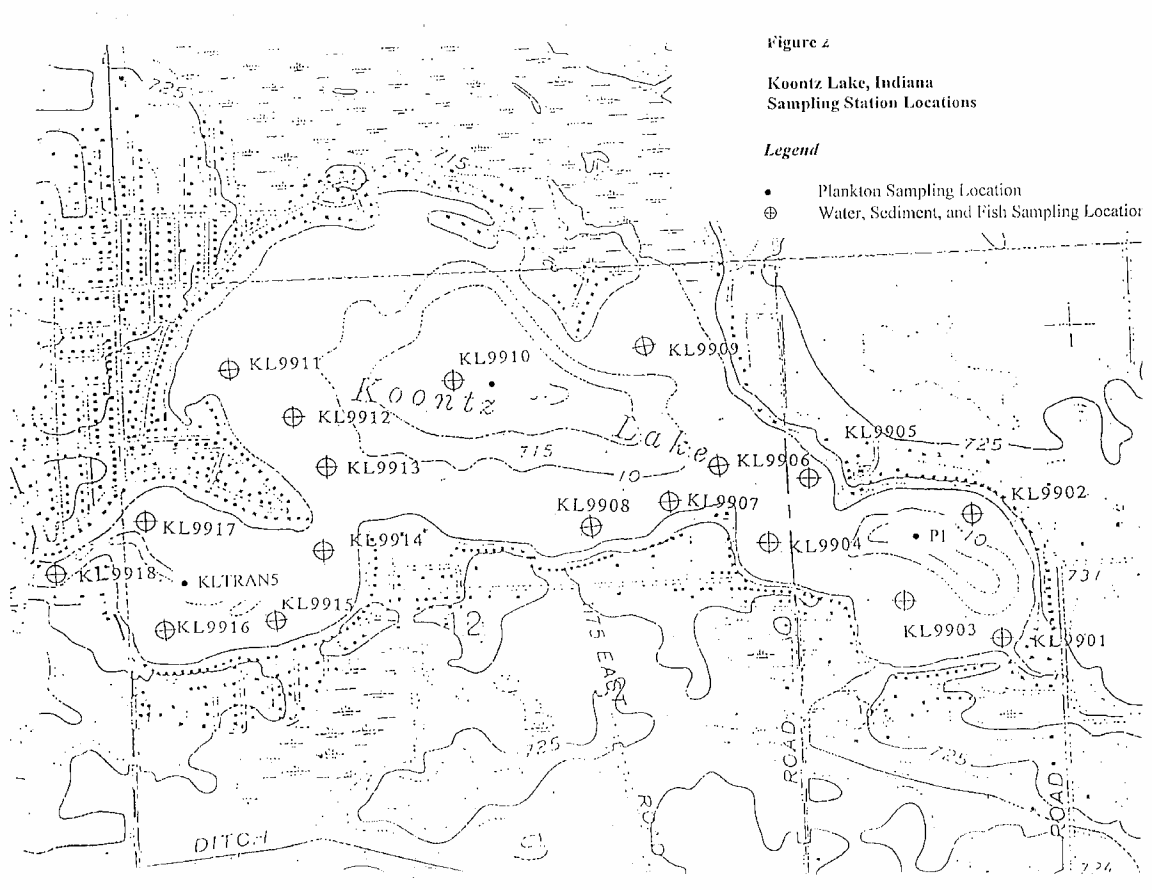
Figure 2
Koontz Lake, Indiana
Sampling Station Locations
Legend
Plankton Sampling Location
Water, Sediment, and Fish Sampling Location
KL9911
KL9910
KL9909
Koontz
Lake
KL9912
KL9913
KL9905
725
715
10
KL9906
KL9902
KL9908
KL9907
KL9917
KL9914
KL9904
P1
KL9918
KLTRAN5
KL9915
KL9916
KL9903
KL9901
2
175 EAST
ROAD
125
DITCH

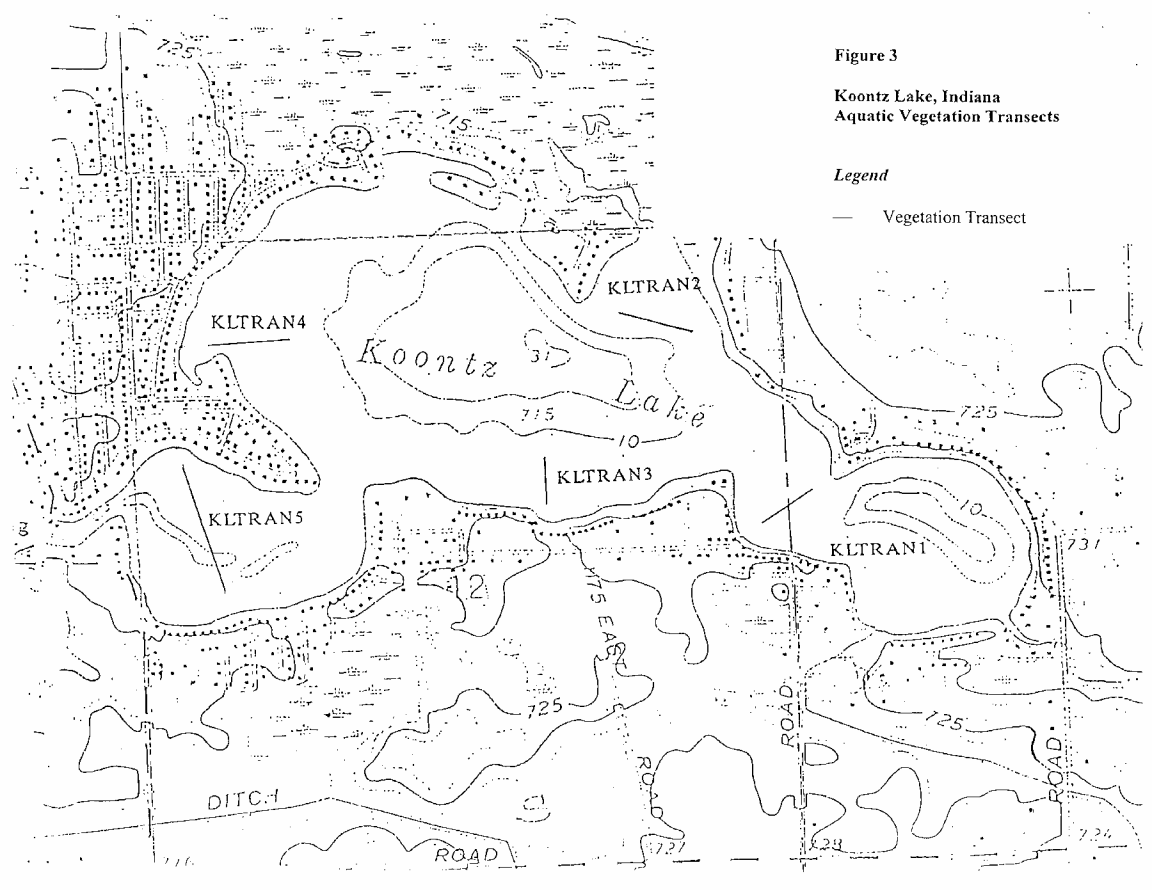

Figure 3

Koontz Lake, Indiana
Aquatic Vegetation Transects

Legend

— Vegetation Transect

TABLES

Table 1
Koontz Lake, Indiana
Diagnostic Study
Sediment Sampling

Date	Site	Depth (ft.)	Latitude	Longitude	No. of Attempts	Total Phosph. mg/Kg	Total Solids %	Physical Description
9/20/99	KL9901	3.7	41.409°N	86.460°W	1	500	16	black silt, filamentous algae
9/20/99	KL9902	6.2	41.411°N	86.461°W	1	440	13	brown silt, extensive detritus
9/20/99	KL9903	3.7	41.409°N	86.462°W	3	380	16	black silt, filamentous algae
9/20/99	KL9904	4.4	41.411°N	86.450°W	1	310	14	brown silt, extensive detritus
9/20/99	KL9905	6.2	41.413°N	86.466°W	1	510	10	brown silt, extensive detritus
9/20/99	KL9906	7.4	41.413°N	86.451°W	1	530	12	brown silt, extensive detritus
9/20/99	KL9907	6.2	41.412°N	86.453°W	1	460	11	brown silt, extensive detritus
9/20/99	KL9908	5.2	41.412°N	86.455°W	1	190	45	black sandy silt, med. organics, snail shells
9/20/99	KL9909	5.2	41.416°N	86.454°W	2	26	80	gray sand
9/20/99	KL9910	29.0	41.415°N	86.473°W	2	820	9	dark-gray to black silt
9/20/99	KL9911	4.3	41.415°N	86.466°W	1	460	12	sandy silt, high organics, hydrogen sulfide odor
9/20/99	KL9912	5.2	41.415°N	86.465°W	1	430	11	brown silt, high organics, hydrogen sulfide odor
9/20/99	KL9913	5.5	41.414°N	86.464°W	1	520	10	brown silt, high organics, hydrogen sulfide odor
9/20/99	KL9914	6.8	41.411°N	86.463°W	1	490	13	brown silt, high organics, hydrogen sulfide odor
9/20/99	KL9915	6.5	41.410°N	86.464°W	1	450	10	brown silt, high organics, hydrogen sulfide odor
9/20/99	KL9916	6.4	41.409°N	86.451°W	1	600	8	brown silt, high organics, hydrogen sulfide odor
9/20/99	KL9917	4.0	41.412°N	86.452°W	1	170	26	sandy silt, med. organics, *Chara* sp., hydrogen sulfide odor
9/20/99	KL9918	6.7	41.411°N	86.454°W	1	490	10	darker silt, med. organics, hydrogen sulfide odor

Table 2
Koontz Lake, Indiana
Diagnostic Study
Water Sampling

Site	Site Depth	Latitude	Longitude	Turbidity	pH	Temp.	Spec. Cond.	Dissolved O_2	O_2 Sat.	NH_4 Nitrogen	Organic Nitrogen	Total Keldahl Nitrogen	Total Phosph.	Chlor.-A	Ortho. Phosph.	Secchi Disk Depth
	ft.	*WGS 84*	*WGS 84*	*NTU*	*no units*	*°C*	*mS/cm*	*mg/L*	*%*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*µg/L*	*µg/L*	*ft.*
KL9901	3.7	41.409°N	86.460°W	3.56	8.55	*	22	*	*	0.07	0.89	0.96	0.024	34	<5	3.0
KL9902	6.2	41.411°N	86.461°W	3.28	8.50	*	22	*	*	0.08	0.92	1.0	0.027	<1.0	<5	2.8
KL9903	3.7	41.409°N	86.462°W	3.80	8.42	*	24	*	*	0.24	0.73	1.0	0.024	<1.0	<5	2.5
KL9904	4.4	41.411°N	86.450°W	2.93	8.38	*	25	*	*	0.08	0.92	1.0	0.024	20	5	3.0
KL9905	6.2	41.413°N	86.466°W	2.83	8.39	*	25	*	*	<0.05	1.0	1.1	0.018	23	<5	3.1
KL9906	7.4	41.413°N	86.451°W	3.95	8.41	*	25	*	*	0.07	1.1	1.2	0.018	23	5	3.0
KL9907	6.2	41.412°N	86.453°W	2.43	8.42	*	29	*	*	<0.05	1.2	1.2	0.028	22	<5	3.0
KL9908	5.2	41.412°N	86.455°W	1.84	8.47	*	29	*	*	0.10	1.4	1.5	0.023	<1.0	<5	3.0
KL9909	5.2	41.416°N	86.454°W	3.16	8.48	*	29	*	*	0.10	0.89	0.99	0.022	<1.0	<5	2.5
KL9911	4.3	41.415°N	86.466°W	5.37	8.50	19.0	31	8.94	94.3	0.06	1.3	1.4	0.037	35	<5	3.0
KL9912	5.2	41.415°N	86.465°W	3.05	8.72	19.3	28	8.73	85.7	<0.05	1.1	1.1	0.025	35	<5	3.5
KL9913	5.5	41.414°N	86.464°W	2.71	8.62	18.9	29	8.88	88.7	0.09	0.85	0.94	0.018	22	<5	3.0
KL9914	6.8	41.411°N	86.463°W	1.82	8.63	19.1	27	9.35	90.9	0.11	11	11	0.016	<1.0	<5	3.0
KL9915	6.5	41.410°N	86.464°W	5.45	8.64	19.0	28	8.74	95	0.10	5.8	5.9	0.019	35	<5	3.5
KL9916	6.4	41.409°N	86.451°W	2.59	8.67	18.8	27	9.04	93.4	0.10	2.8	2.9	0.023	35	<5	3.5
KL9917	4.0	41.412°N	86.452°W	3.15	8.69	19.1	27	9.50	95.6	0.08	1.9	2.0	0.025	59	<5	3.0
KL9918	6.7	41.411°N	86.454°W	2.47	8.69	19.7	28	7.79	84.4	0.23	5.4	5.6	0.027	<1.0	<5	3.0
KL9910	**Sample Depth**															
KL9910	3	41.415°N	86.473°W	3.80	8.60	*	30	9.74	*	0.11	1.3	1.4	0.016	0.035	<0.005	3.0
KL9910	6	41.415°N	86.473°W	3.95	8.56	*	30	10.07	*	NA	NA	NA	NA	NA	NA	NA
KL9910	9	41.415°N	86.473°W	5.76	8.55	*	30	*	*	NA	NA	NA	NA	NA	NA	NA
KL9910	12	41.415°N	86.473°W	2.59	8.53	*	29	*	*	NA	NA	NA	NA	NA	NA	NA
KL9910	15	41.415°N	86.473°W	5.45	8.51	*	29	*	*	NA	NA	NA	NA	NA	NA	NA
KL9910	18	41.415°N	86.473°W	4.13	8.49	*	29	*	*	NA	NA	NA	NA	NA	NA	NA
KL9910	21	41.415°N	86.473°W	4.42	8.47	*	29	*	*	NA	NA	NA	NA	NA	NA	NA
KL9910	24	41.415°N	86.473°W	3.20	8.46	*	29	*	*	NA	NA	NA	NA	NA	NA	NA
KL9910-B	27	41.415°N	86.473°W	3.23	8.46	*	28	*	*	0.06	1.1	1.2	0.021	0.035	0.005	NA
KL9910	30	41.415°N	86.473°W	4.95	8.46	*	29	*	*	NA	NA	NA	NA	NA	NA	NA

Table 3
Koontz Lake, Indiana
Diagnostic Study
Plankton Sampling

Date	Sampling Team*	Time	Depth (ft.)	Latitude	Longitude	Site	Total Zooplankton Organisms/L	Cyanophyte Algae Million cells/L (% of Total Algae)	Non-Cyanophyte Algae Million cells/L (% of Total Algae)	Total Algae Million cells/L
9/21/99	TW, MM	12:40 PM	0-5'	41.410° N	86.481°W	KLTRAN5-1	187.9	2.4 (94.9)	0.1 (5.1)	2.5
			0-5'	41.410° N	86.481°W	KLTRAN5-2	213.5	1.9 (92.8)	0.2 (7.2)	2.1
9/21/99	TW, MM	11:53 AM	0-5'	41.411° N	86.462°W	P1-1	201.7	3.2 (95.5)	0.2 (4.5)	3.4
			0-5'	41.411° N	86.462°W	P1-2	442.3	2.3 (86.8)	0.4 (13.2)	2.7
9/21/99	TW, MM	12:20 PM	0-5'	41.415° N	86.473°W	KL9910-1	205.3	1.2 (84.2)	0.2 (15.8)	1.4
			0-20'	41.415° N	86.473°W	KL9910-2	117.8	0.58 (92.0)	0.05 (8.0)	0.63

*TW- Timothy Watkins
MM- Molly Mott

Table 4
Koontz Lake, Indiana
Diagnostic Study
Aquatic Vegetation Sampling

Site	Date	Sampling Team *	Time	Starting Latitude	Starting Longitude	Ending Latitude	Ending Longitude	Common Name	Family	*Genus*	Number of Throws	Comments
KLTRAN3	9/20/99	MM, TW, PB	12:00 PM	41.412° N	86.472° W	41.413° N	86.472° W	milfoil	Haloragaceae	*Myriophyllum*	13	> 6 ft. deep, no milfoil present
								water celery	Hydrocharitaceae	*Vallisneria*	13	
KLTRAN1	9/20/99	MM, TW, PB	11:00 AM	41.412° N	86.465° W	41.412° N	86.465° W	milfoil	Haloragaceae	*Myriophyllum*	26	high filamentous algae
								water celery	Hydrocharitaceae	*Vallisneria*	26	
								pondweed	Potamogetonaceae	*Potamogeton*	26	
KLTRAN2	9/20/99	MM, TW, PB	11:50 AM	41.416° N	86.470° W	41.416° N	86.469° W	milfoil	Haloragaceae	*Myriophyllum*	24	first 2/3 of transect contained milfoil; then Chara
								pondweed	Potamogetonaceae	*Potamogeton*	24	and pondweed increased towards the bay side
								muskgrass; stonewort	Characeae	*Chara*	24	of transect, then milfoil dominated.
KLTRAN4	9/21/99	MM, TW	10:50 AM	41.415° N	86.484° W	41.415° N	86.480° W	milfoil	Haloragaceae	*Myriophyllum*	11	99% milfoil; at end of milfoil, filamentous algae
								water celery	Hydrocharitaceae	*Vallisneria*	11	only.
								pondweed	Potamogetonaceae	*Potamogeton*	11	
KLTRAN5	9/21/99	MM, TW	11:10 AM	41.412° N	86.485° W	41.410° N	86.479° W	milfoil	Haloragaceae	*Myriophyllum*	19	Chara between milfoil patches; milfoil
								muskgrass; stonewort	Characeae	*Chara*	19	started again at 5' depth: 4124.634, 8628.820.

* MM- Molly Mott, SEG
TW- Timothy Watkins, SEG
PB- Paul Baxter, COE

Ta ;

Koontz Lake, Indiana
Diagnostic Study
Fish Sampling

Site	Date	Sampling Team *	Depth (ft.)	No. Net Hours	Latitude	Longitude	Common Name	Genus	Species	Length (cm)	Weight (g)	Comments
KL9903	9/21/99	MM, TW, PB	3.8	23	41.409° N	86.462° W	black crappie	*Pomoxis*	*nigromaculatus*	18.8	90	low vegetation, high filamentous algae
							black crappie	*Pomoxis*	*nigromaculatus*	17.4	67	
							bluegill	*Lepomis*	*macrochirus*	~12	escaped	
							largemouth bass	*Micropterus*	*salmoides*	~14	escaped	
							sunfish sp.	*Lepomis*		~12	escaped	
KL9904	9/21/99	MM, TW, PB	4.4	23	41.411° N	86.467° W	black crappie	*Pomoxis*	*nigromaculatus*	22.0	130	no abnormalities
							black crappie	*Pomoxis*	*nigromaculatus*	17.8	75	
							black crappie	*Pomoxis*	*nigromaculatus*	14.6	40	
							black crappie	*Pomoxis*	*nigromaculatus*	20.0	110	
							bluegill	*Lepomis*	*macrochirus*	15.5	55	
							largemouth bass	*Micropterus*	*salmoides*	25.1	160	
KL9909	9/21/99	MM, TW, PB	6.2	23	41.418° N	86.470° W	black crappie	*Pomoxis*	*nigromaculatus*	21.2	115	no abnormalies, high vegetation
							bluegill	*Lepomis*	*macrochirus*	13.7	40	
							bluegill	*Lepomis*	*macrochirus*	13.0	40	
							black bullhead	*Ameiurus*	*melas*	28.5	230	
							gizzard shad	*Dorosoma*	*cepedianum*	29.0	185	
							green sunfish	*Lepomis*	*cyanellus*	15.0	70	
							yellow perch	*Perca*	*flavescens*	21.8	100	
							yellow perch	*Perca*	*flavescens*	22.0	80	
KL9912	9/21/99	MM, TW, PB	5.2	23	41.415°N	86.462° W	black bullhead	*Ameiurus*	*melas*	20.8	110	off of and parallel to vegetation
							black bullhead	*Ameiurus*	*melas*	27.5	230	
							black bullhead	*Ameiurus*	*melas*	29.5	375	
							black bullhead	*Ameiurus*	*melas*	28.0	315	
							black crappie	*Pomoxis*	*nigromaculatus*	22.6	165	
							black crappie	*Pomoxis*	*nigromaculatus*	23.7	135	
							bluegill	*Lepomis*	*macrochirus*	21.0	150	
							pumpkinseed	*Lepomis*	*gibbosus*	15.5	55	
							pumpkinseed	*Lepomis*	*gibbosus*	22.0	170	
							pumpkinseed	*Lepomis*	*gibbosus*	16.8	85	
							pumpkinseed	*Lepomis*	*gibbosus*	15.5	75	
							pumpkinseed	*Lepomis*	*gibbosus*	11.7	35	
							pumpkinseed	*Lepomis*	*gibbosus*	16.5	100	
							yellow perch	*Perca*	*flavescens*	27.0	190	
KL9915	9/21/99	MM, TW, PB	7.5	23	41.416° N	86.480°W	black crappie	*Pomoxis*	*nigromaculatus*	23.5	155	inside moderate vegetation, right lead 3 ft. shorter
							black crappie	*Pomoxis*	*nigromaculatus*	23.0	155	
							bluegill	*Lepomis*	*macrochirus*	14.5	75	
							pumpkinseed	*Lepomis*	*gibbosus*	17.5	140	
KL9917	9/21/99	MM, TW, PB	5	23	41.412° N	86.485°W	black crappie	*Pomoxis*	*nigromaculatus*	12.4	35	surrounded by vegetation
							black crappie	*Pomoxis*	*nigromaculatus*	20.1	100	
							green sunfish	*Lepomis*	*cyanellus*	18.0	125	

* MM- Molly Mott, SEG
TW- Timothy Watkins, SEG
PB- Paul Baxter, COE

APPENDIX A

CHAIN-OF-CUSTODY SHEETS

DLZ Laboratories, Inc.

ENVIRONMENTAL TESTING • COMPLIANCE ANALYSIS
RIAL HYG

1120 May Street • Lansing, Michigan 48906-5599
Telephone (517) 374-9656 • FAX (517) 374-6910

CUSTODY RECORD

REPORT PAGE: 1 OF 2

RECORD NUMBER: 2 124

RESULTS TO

NAME: Tim Watkins
COMPANY: SEG
ADDRESS: 1120 May St
CITY: Lansing STATE: MI ZIP: 48906

SAMPLED BY: Tim Watkins
P.O. #:
PHONE NO.: 517 374 6800
FAX NO.: 517 374 7390

PROJECT NAME: Krontz Lake
PROJECT # OR LOCATION:
REPORTING LIMITS: none

INVOICE TO

NAME:
COMPANY: Same
ADDRESS:
CITY: STATE: ZIP:

NUMBER/TYPE CONTAINER: NONE, NITRIC, H2SO4, NaOH, HCl, FILTERED Y/N

ANALYSIS REQUESTED: Nitro Tally A

ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST

LAB # (LAB USE ONLY)

ITEM NO.	CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	Nitro Tally A	LAB #
1	KL99 18	9/21/99	1245	Water	✓					N	X	
2	KL99 17	↓	105	↓	↓					↓	↓	
3	KL99 16		115									
4	KL99 15		125									
5	KL99 14		130									
6	KL99 13		135									
7	KL99 12		140									
8	KL99 11		150 TJW									
9	KL99 10		155 TJW									
10	KL99 09	↓	215	↓	↓					↓	↓	

TRANSFER NO.	RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
1	Molly Hall	9-21-99	4:30				
2							
3							
4							

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED:

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

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ENVIRONMENTAL TESTING & COMPLIANCE ANALYSIS TRIALS

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CHAIN OF CUSTODY RECORD

REPORT PAGE 2 OF 2

RECORD NUMBER 2 125

SUBMIT TO

NAME: Tim Watkins
COMPANY: SEG
ADDRESS: 1120 May St
CITY: Lansing STATE: MI ZIP: 48906

SAMPLED BY: Tim Watkins
P.O. #:
PHONE NO.: 517 374 6800
FAX NO.: 517 374 7390

PROJECT NAME: Krantz Lake
PROJECT # OR LOCATION:
REPORTING LIMITS: None

BILL TO

NAME:
COMPANY: See above
ADDRESS:
CITY STATE ZIP

NO.	CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX OF MEDIA	NUMBER/TYPE CONTAINER: NONE	METRIC	H2SO4	NaOH	HCl	FILTERED YES/NO	UNFILTERED YES/NO	ANALYSIS REQUESTED: ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST	LAB # (LAB USE ONLY)
1	KL99 08	9/21/99	2:25	Water	V					N	X		
2	KL99 07		2:30										
3	KL99 06		2:35										
4	KL99 05		2:40										
5	KL99 04		2:50										
6	KL99 03		2:53										
7	KL99 02		2:55										
8	KL99 01		3:00										
9	KL9910B		2:05										
0													

ANSFER NO.	RELINQUISHED BY/AFFILIATION	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
1	Molly Hall	9-21-99	4:30				
2							
3							
4							

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED:

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

CLIENT COPY

INDUSTRIAL HYGIENE

Laboratories, Inc.

lay Stre ... nsing, ... 48906

Telephone (517) 374-9656 • FAX (517) 374-6910

CUSTODY RECORD

REPORT PAGE 1 OF 2

RECORD NUMBER 22?22

NAME Tim Watkins	SAMPLED BY Tim Watkins
COMPANY SEG	P.O. #
ADDRESS 1120 May St	PHONE NO. 517 ?? 7393
CITY Lansing STATE MI ZIP 48906	FAX NO. 517 374 6800
NAME C	
COMPANY Tecnomic	
ADDRESS	
CITY STATE ZIP	

PROJECT NAME: Kroll Lake

PROJECT # OR LOCATION:

REPORTING LIMITS: none

NUMBER/TYPE CONTAINER — ANALYSIS REQUESTED — LAB # (LAB USE ONLY)

ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	[illegible]										LAB # (LAB USE ONLY)
KL9915	9/21/99	1245	Water	✓					Y	X										
KL9917	↓	105	↓	✓					Y	↓										
KL9916		115		✓					Y											
KL9918		125		✓					Y											
KL9914		130		✓					Y											
KL9913		1??		✓					Y											
KL9912		140		✓					Y											
KL9911		150		✓					Y											
KL9910		[illegible]		✓					Y											
KL9909		215		✓					Y											

TRANSFER NO.	RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
1	[signature]	9-21-99	[illegible]				
2							
3							
4							

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

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ENVIRONMENTAL TESTING • COMPLIANCE ANALYSIS • INDUSTRIAL

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CUSTODY RECORD

REPORT PAGE	RECORD NUMBER
2 OF X	27923

REPORT RESULTS TO

NAME	Tim Watkins	SAMPLED BY	Tim Watkins
COMPANY	SEG	P.O. #	
ADDRESS	1120 May St.	PHONE NO.	517 374 6560
CITY	Lansing STATE MI ZIP 48906	FAX NO.	517 374 7310

PROJECT NAME	Koontz Lake
PROJECT # OR LOCATION	
REPORTING LIMITS	none

INVOICE TO

NAME	
COMPANY	as above
ADDRESS	
CITY STATE ZIP	

NUMBER/TYPE CONTAINER — ANALYSIS REQUESTED — LAB # (LAB USE ONLY)

ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST

ITEM NO.	CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	orthophos	LAB #
1	KL9908	9/21/99	2:25	Water	✓					Y	X	
2	KL9907	↓	2:30	↓	↓					↓	↓	
3	KL9906	↓	2:35	↓	↓					↓	↓	
4	KL9905	↓	2:40	↓	↓					↓	↓	
5	KL9904	↓	2:50	↓	↓					↓	↓	
6	KL9903	↓	2:52	↓	↓					↓	↓	
7	KL9902	↓	2:55	↓	↓					↓	↓	
8	KL9901	↓	3:00	↓	↓					↓	↓	
9	KL9910-B	↓	3:05	↓	↓					↓	↓	
10					↓					↓	↓	

TRANSFER NO.	RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
1	[signature]	9-21-99	4:30				
2							
3							
4							

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

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Inc.

May S ansing an 4890
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CUSTODY
ORD

REPORT PAGE / OF

RECORD NUMBER 27326

SULTS TO

NAME
COMPANY
ADDRESS
CITY STATE ZIP

SAMPLED BY
P.O. #
PHONE NO.
FAX NO.

PROJECT NAME
PROJECT # OR LOCATION
REPORTING LIMITS

NAME
COMPANY
ADDRESS
CITY STATE ZIP

NUMBER/TYPE CONTAINER

ANALYSIS REQUESTED

NONE | NITRIC | H2SO4 | NAOH | HCl | FILTERED Y/N | Lab Cert # | Matrix Spike

LAB # (LAB USE ONLY)

| SAMPLE NO. | CLIENT SAMPLE IDENTIFICATION | DATE SAMPLED | TIME SAMPLED | MATRIX MEDIA | ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST | | |

...abora... Inc.

...0 May... Lansin... ...gan 48...
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...CUSTODY RECORD

2?...33

REPORT RESULTS TO

NAME [illegible]	SAMPLED BY [illegible]
COMPANY SEO	P.O. #
ADDRESS [illegible]	PHONE NO. [illegible]
CITY Lansing STATE MI ZIP 4690?	FAX NO. [illegible]

PROJECT NAME	[illegible]
PROJECT # OR LOCATION	
REPORTING LIMITS	None

INVOICE TO

NAME
COMPANY Same
ADDRESS
CITY STATE ZIP

NUMBER/TYPE CONTAINER — ANALYSIS REQUESTED — ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST

ITEM NO.	CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	[illegible]	[illegible]									LAB # (LAB USE ONLY)
1	KL99 08	9-21-99	325	Water			X			N	X	X									
2	KL99 07	↓	230	↓			↓			↓	↓	↓									
3	KL99 06	↓	235	↓			↓			↓	↓	↓									
4	KL99 05	↓	240	↓			↓			↓	↓	↓									
5	KL99 04	↓	250	↓			↓			↓	↓	↓									
6	KL99 03	↓	253	↓			↓			↓	↓	↓									
7	KL99 02	↓	255	↓			↓			↓	↓	↓									
8	KL99 01	↓	300	↓			↓			↓	↓	↓									
9	KL9910 - B	↓	205	↓			↓			↓	↓	↓									
10																					

TRANSFER NO.	RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
1	[signature]	9-23-99	11:25	[signature]	9-23	10:5	
2							
3							
4							

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

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CHAIN OF CUSTODY RECORD

REPORT PAGE 1 OF 2 | RECORD NUMBER 2922

REPORT RESULTS TO:

NAME: Tim Wathus | SAMPLED BY: Tim Wathus | PROJECT NAME: Krome Lake

COMPANY: SEG | P.O. #: | PROJECT # OR LOCATION:

ADDRESS: 1120 May St | PHONE NO.: (517) 324 7349 | REPORTING LIMITS: None

CITY: Lansing STATE: MI ZIP: 48906 | FAX NO.: 517 374 6850

INVOICE TO:

NAME:

COMPANY: See above

ADDRESS:

CITY STATE ZIP

NUMBER/TYPE CONTAINER | ANALYSIS REQUESTED

ITEM NO.	CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	24hr-BOD	ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST	LAB # (LAB USE ONLY)
1	KL9918	9/21/99	1245	Water	✓					Y	X		DL24192-1
2	KL9917		105		✓					Y			2
3	KL9916		115		✓					Y			3
4	KL9915		125		✓					Y			4
5	KL9914		130		✓					Y			5
6	KL9913		135		✓					Y			6
7	KL9912		140		✓					Y			7
8	KL9911		150		✓					Y			8
9	KL9910		~~155~~ CANCELLED		✓					Y			9
10	KL9907	↓	015	↓	✓					Y	↓		10

TRANSFER NO.	RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
1	[illegible]	9-21-99	4:30				
2	[illegible]	9-22-99	1100	Obergruber	9-22-99	1100	
3							
4							

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

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CUSTODY RECORD

REPORT PAGE 2 OF 2

RECORD NUMBER 923

RESULTS TO:

NAME: Tim Watkins
COMPANY: SEG
ADDRESS: 1120 May St.
CITY: Lansing STATE: MI ZIP: 48906

SAMPLED BY: Tim Watkins
P.O. #:
PHONE NO.: 517 374 6860
FAX NO.: 517 374 7510

PROJECT NAME: Koontz Lake
PROJECT # OR LOCATION:
REPORTING LIMITS: none

INVOICE TO:

NAME:
COMPANY: see above
ADDRESS:
CITY: STATE: ZIP:

NUMBER/TYPE CONTAINER — ANALYSIS REQUESTED

ITEM	CLIENT/SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	ORTHOPO4	LAB # (LAB USE ONLY)
	ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST											
1	KL9908	9/21/99	2:25	Water	V					Y	X	DL24192-11
2	KL9907		2:30									12
3	KL9906		2:35									13
4	KL9905		2:40									14
5	KL9904		2:50									15
6	KL9903		2:53									16
7	KL9902		2:55									17
8	KL9901		3:00									18
9	KL9910-B		2:005									19
10												

ANSWER NO.	RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION (LAB)
1	Molly Ahn	9-21-99	4:30				
2	Jean Jody	9-22-99	1100	Obregon	9-22-99	1100	
3							
4							

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED:

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

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CUSTODY RECORD

REPORT PAGE 1 OF 2

RECORD NUMBER 2[illegible]85

NAME: Tim Watkins	SAMPLED BY: Tim Watkins	PROJECT NAME	Koontz Lake
COMPANY: SEG	P.O. #	PROJECT # OR LOCATION	9941-S494-21
ADDRESS: 1120 May St	PHONE NO. 517 374 6800	REPORTING LIMITS	none
CITY: Lansing STATE: MI ZIP: 48906	FAX NO. 517 374 7310		

NAME	
COMPANY	Same as above
ADDRESS	
CITY / STATE / ZIP	

NUMBER/TYPE CONTAINER: NONE, NITRIC, H2SO4, NaOH, HCl, FILTERED Y/N

ANALYSIS REQUESTED: Total phosphorus

ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	Total phosphorus	LAB # (LAB USE ONLY)
KL9901	9-20-99	220	sediment	✓					N	X	DL24215-1
KL9902	↓	230	↓	↓					↓	↓	2
KL9903	↓	235	↓	↓					↓	↓	3
KL9904	↓	245	↓	↓					↓	↓	4
KL9905	↓	250	↓	↓					↓	↓	5
KL9906	↓	255	↓	↓					↓	↓	6
KL9907	↓	258	↓	↓					↓	↓	7
KL9908	↓	3:00	↓	↓					↓	↓	8
KL9909	↓	3:05	↓	↓					↓	↓	9
KL9910	↓	3:07	↓	↓					↓	↓	10

TRANSFER	RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
1	[signature]	9/23/99	4:10 pm	[signature]	9-23-99	1610	
2							
3							
4							

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

ACCOUNTING

1-200

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CHAIN OF CUSTODY RECORD

REPORT PAGE 2 OF 2

RECORD NUMBER 23 36

NAME Tim Watkins
COMPANY SEG
ADDRESS 1120 May St
CITY Lansing STATE MI ZIP 48906

SAMPLED BY Tim Watkins
P.O. #
PHONE NO. 517 374 6800
FAX NO. 517 374 7390

PROJECT NAME Koontz Lake
PROJECT # OR LOCATION 9941-5494-21
REPORTING LIMITS none

NAME
COMPANY same as above
ADDRESS
CITY STATE ZIP

NUMBER/TYPE CONTAINER: NONE, NITRIC, H2SO4, NaOH, HCl, FILTERED Y/N

ANALYSIS REQUESTED: total phosphorus; particle size distribution

ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	total phosphorus	particle size distribution								LAB # (LAB USE ONLY)
KL9911	9-20-99	3:20	sediment	✓					N	X									DL24215-11
KL9912	↓	3:25	↓	↓					↓	↓									12
KL9913	↓	3:30	↓	↓					↓	↓									13
KL9914	↓	3:36	↓	↓					↓	↓									14
KL9915	↓	3:41	↓	↓					↓	↓									15
KL9916	↓	3:46	↓	↓					↓	↓									16
KL9917	↓	3:50	↓	↓					↓	↓									17
KL9918	↓	4:00	↓	↓					↓	↓									18
KL9910-P	↓	3:07	↓	↓					↓		X								
KL9918-P	↓	4:00	↓	↓					↓		X								

RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
[signature]	9/23/99	4:10pm	D. Rodriguez	9-23-99	1610	

ADDITIONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

grain size subbed to dlz

IMPORTANT - TURN AROUND TIME
DATE RESULTS EXPECTED
☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

ACCOUNTING

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CUSTODY RECORD

REPORT PAGE 3 OF 3

RECORD NUMBER 18 16

NAME: Tim Watkins
COMPANY: SEG
ADDRESS: 1120 May St.
CITY / STATE / ZIP

SAMPLED BY: Tim Watkins
P.O. #
PHONE NO. 517 374 6800
FAX NO. 5173747390

PROJECT NAME: Koontz Lake
PROJECT # OR LOCATION: 9941-5901-21
REPORTING LIMITS: none

NAME: Same as above
COMPANY
ADDRESS
CITY / STATE / ZIP

NUMBER/TYPE CONTAINER: NONE, NITRIC, H2SO4, NaOH, HCl, FILTERED Y/N

ANALYSIS REQUESTED: particle size analysis

LAB # (LAB USE ONLY)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX MEDIA	NONE	NITRIC	H2SO4	NaOH	HCl	FILTERED Y/N	particle size analysis										LAB #
KL9901-P	9-20-99	2:20	sediment	V					N	X										

ENTER AN "X" IN THE BOX BELOW TO INDICATE REQUEST

RELINQUISHED BY	DATE	TIME	ACCEPTED BY	DATE	TIME	CONDITION
Molly [illegible]	9/23/99	4:10pm	Dbrigunzia	9-23-99	1610	

...IONAL COMMENTS (PLEASE RECORD SPECIAL HANDLING/HAZARD INFORMATION) PAID IN FULL ☐ YES ☐ NO

IMPORTANT - TURN AROUND TIME

DATE RESULTS EXPECTED

☐ 24 HR. ☐ 48 HR. ☐ 5 DAY ☐ STANDARD

ACCOUNTING

APPENDIX B

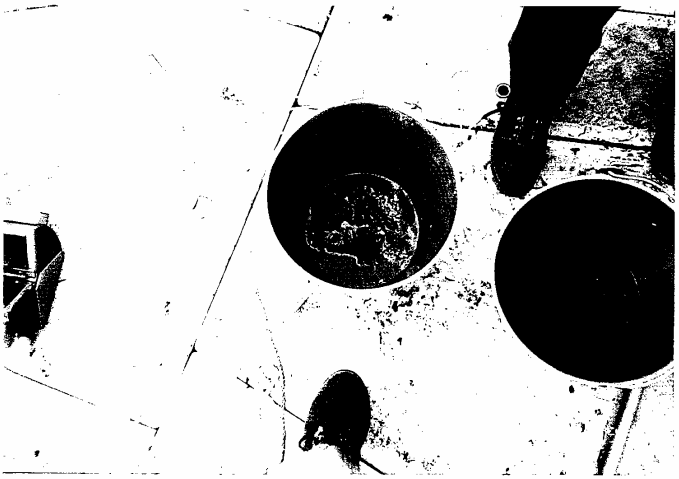
PHOTOGRAPHS

9/20/99 View of aquatic vegetation (milfoil) seen near station KL9913.

9/20/99 Northwest view from station KL9903.

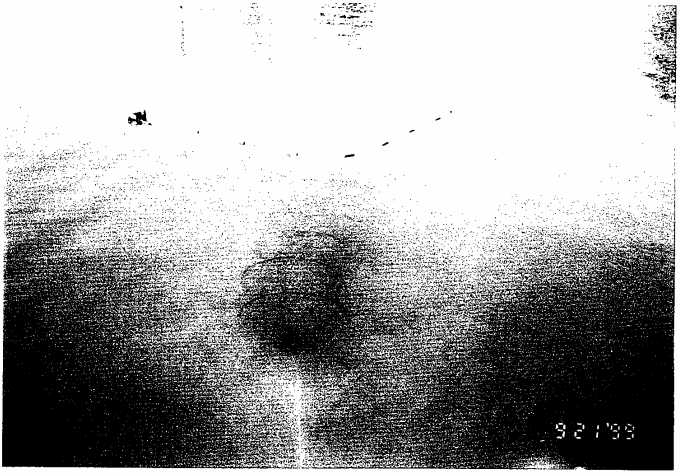
9/21/99 Sediment collected by ponar grab from station KL9904.

9/21/99 Sediment collected by ponar grab from station KL9911.

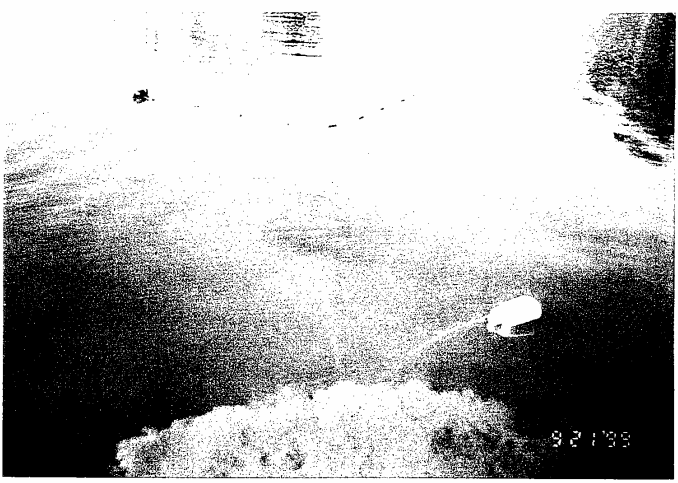


9/21/99 Second view, sediment collected by ponar grab from station KL9911.

9/21/99 Sediment collected by ponar grab from station KL9901.



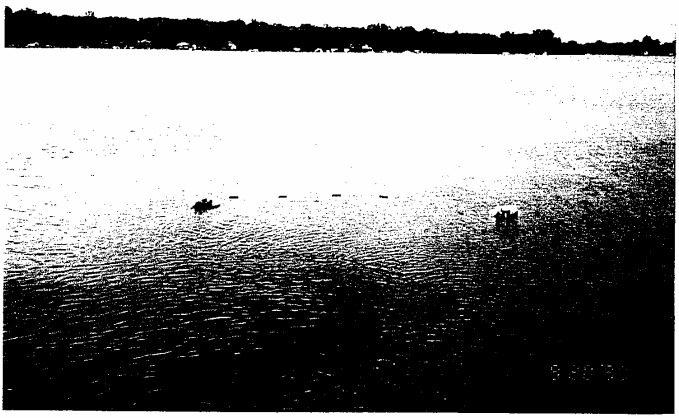
9/21/99 Set fyke net illustrating vertical-sitting hoops, immediately prior to net retrieval.



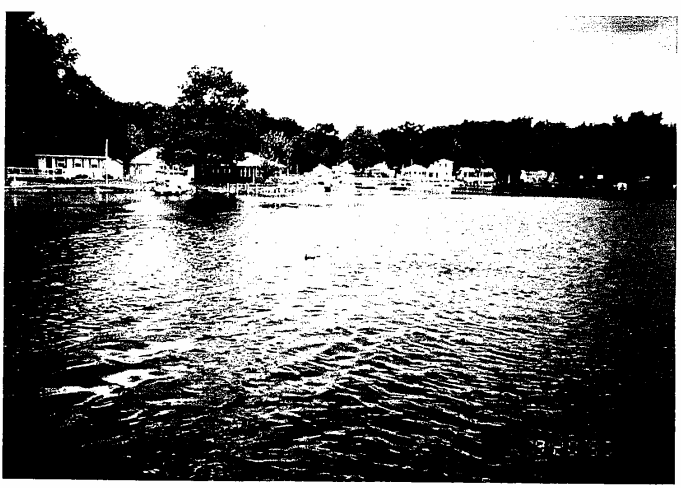
9/21/99 Second view, set fyke net illustrating vertical-sitting hoops, immediately prior to net retrieval.

9/20/99 Set fyke net at station KL9903.

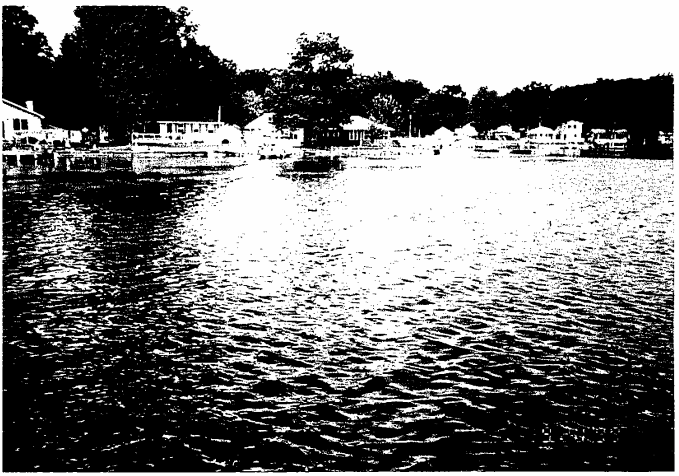
9/20/99 Second view, set fyke net at station KL9903.



9/20/99 Set fyke net at station KL9909.



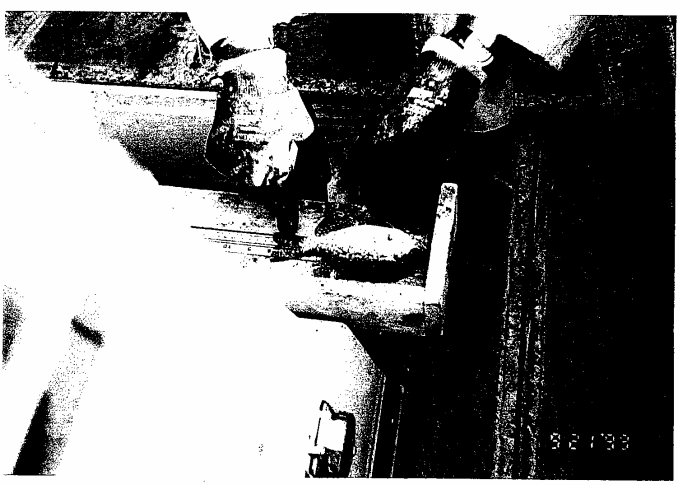
9/20/99 Set fyke net adjacent to vegetation at station KL9912.



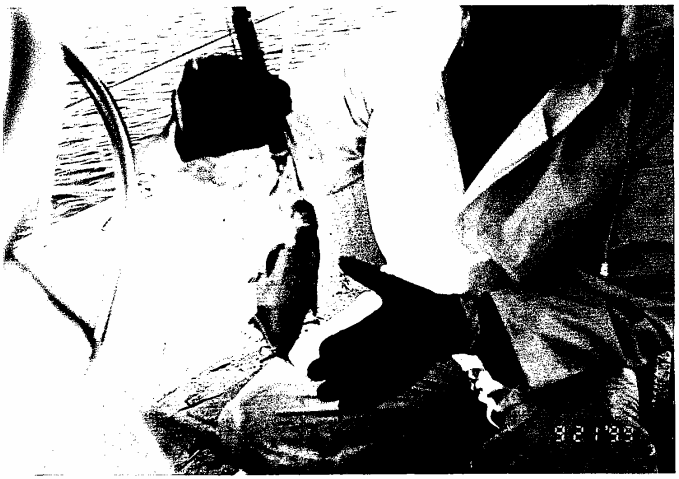
9/20/99 Second view, set fyke net at station KL9912.

9/20/99 Set fyke net at station KL9917.

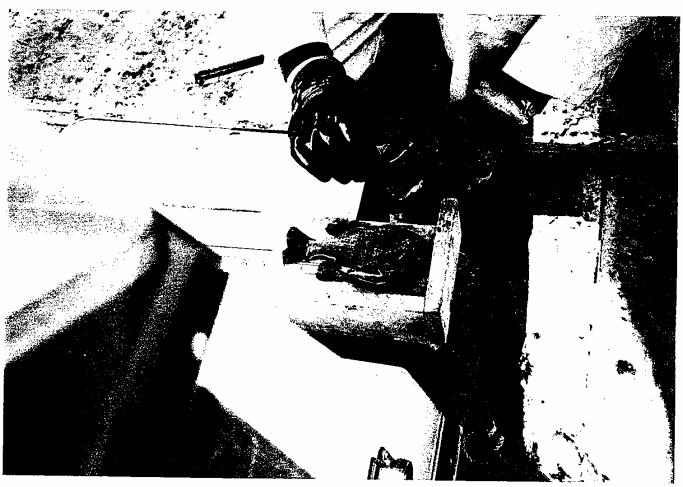
9/21/99 Weighing black crappie caught in fyke net.



9/21/99 Measuring length of black crappie.



9/21/99 Weighing gizzard shad caught in fyke net.



9/21/99 Measuring length of bluegill.

9/21/99 Weighing black crappie caught in fyke net.

9/21/99 Weighing bullhead caught in fyke net.

9/21/99 Opening "pot" of fyke net to retrieve trapped fish.

9/22/99 Use of Hydrolab® for water quality sampling at station KL9910.

9/22/99 Second view, use of Hydrolab® for water quality sampling at station KL9910.

APPENDIX C

ANALYTICAL RESULTS

WATER QUALITY ANALYTICAL RESULTS

microbiological associates, inc.

Date: 10/21/99
Project Name: Koontz Lake

TO: DLZ Laboratories
1120 May St
Lansing, Mi. 48906

MA Report #: 10382

MA Sample #: 4869-4887

Sample #	Sample Description	Analysis	Result	Units	MDL	Method	Date Analyzed
4869	KL9918	Chlorophyll A	ND	mg/L	0.001	SM 10200 H	10/21/99
4870	KL9917	Chlorophyll A	0.059	mg/L	0.001	SM 10200 H	10/21/99
4871	KL9916	Chlorophyll A	0.035	mg/L	0.001	SM 10200 H	10/21/99
4872	KL9915	Chlorophyll A	0.035	mg/L	0.001	SM 10200 H	10/21/99
4873	KL9914	Chlorophyll A	ND	mg/L	0.001	SM 10200 H	10/21/99
4874	KL9913	Chlorophyll A	0.022	mg/L	0.001	SM 10200 H	10/21/99
4875	KL9912	Chlorophyll A	0.035	mg/L	0.001	SM 10200 H	10/21/99
4876	KL9911	Chlorophyll A	0.035	mg/L	0.001	SM 10200 H	10/21/99
4877	KL9910	Chlorophyll A	0.035	mg/L	0.001	SM 10200 H	10/21/99
4878	KL9909	Chlorophyll A	ND	mg/L	0.001	SM 10200 H	10/21/99
4879	KL9908	Chlorophyll A	ND	mg/L	0.001	SM 10200 H	10/21/99
4880	KL9907	Chlorophyll A	0.022	mg/L	0.001	SM 10200 H	10/21/99
4881	KL9906	Chlorophyll A	0.023	mg/L	0.001	SM 10200 H	10/21/99
4882	KL9905	Chlorophyll A	0.023	mg/L	0.001	SM 10200 H	10/21/99
4883	KL9904	Chlorophyll A	0.02	mg/L	0.001	SM 10200 H	10/21/99
4884	KL9903	Chlorophyll A	ND	mg/L	0.001	SM 10200 H	10/21/99
4885	KL9902	Chlorophyll A	ND	mg/L	0.001	SM 10200 H	10/21/99
4886	KL9901	Chlorophyll A	0.034	mg/L	0.001	SM 10200 H	10/21/99
4887	KL9910B	Chlorophyll A	0.035	mg/L	0.001	SM 10200 H	10/21/99

Francis B. McLaughlin, FAIC

Microbiologist Initials:

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-1
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9918 KOONTZ LAKE / COE	Aqueous		21 SEP 99/12:45	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-2
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9917 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:05	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-3
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9916 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:15	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-4
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9915 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:25	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-5
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9914 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:30	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-6
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9913 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:35	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-7
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9912 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:40	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-8
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9911 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:50	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-9
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9910 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:55	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-10
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9909 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:15	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-11
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9908 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:25	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-12
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9907 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:30	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-13
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9906 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:35	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-14
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9905 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:40	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-15
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9904 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:50	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-16
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9903 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:53	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-17
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9902 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:55	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

DLZ LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-18
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9901 KOONTZ LAKE / COE	Aqueous		21 SEP 99/15:00	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	<0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24192-19
Report Date: 10/04/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9910-B KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:05	22 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ortho Phosphorous	0.005	0.005	mg/L	4500P-E	09-23-99	MB

* Reportable Detection Limit

Approved By
Scott Hayward
Production Manager

DLZ LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-1
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9918 KOONTZ LAKE / COE	Aqueous		21 SEP 99/12:45	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.23	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	5.4	---	mg/L	4500N		
Total Kjeldahl Nitrogen	5.6	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.027	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

DLZ LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-2
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9917 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:05	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.08	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.9	---	mg/L	4500N		
Total Kjeldahl Nitrogen	2.0	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.025	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

DLZ
LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-3
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9916 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:15	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.10	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	2.8	---	mg/L	4500N		
Total Kjeldahl Nitrogen	2.9	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.023	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-4
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9915 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:25	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.10	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	5.8	---	mg/L	4500N		
Total Kjeldahl Nitrogen	5.9	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.019	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-5
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9914 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:35	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.11	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	11	---	mg/L	4500N		
Total Kjeldahl Nitrogen	11	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.015	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

DLZ LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-6
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9913 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:30	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.09	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	0.85	---	mg/L	4500N		
Total Kjeldahl Nitrogen	0.94	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.018	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-7
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9912 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:40	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	<0.05	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.1	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.1	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.025	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-8
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9911 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:50	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.06	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.3	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.4	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.037	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-9
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9910 KOONTZ LAKE / COE	Aqueous		21 SEP 99/13:55	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.11	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.3	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.4	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.016	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
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INDUSTRIAL HYGIENE

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9909 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:15	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.10	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	0.89	---	mg/L	4500N		
Total Kjeldahl Nitrogen	0.99	0.10	mg/L	351.4	10-14-99	CTI
Total Phosphorous	0.022	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24214-11
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9908 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:25	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.10	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.4	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.5	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.023	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24214-12
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9907 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:30	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	<0.05	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.2	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.2	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.028	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

DLZ LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24214-13
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9906 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:35	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.07	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.1	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.2	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.018	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24214-14
Report Date: 10/20/99

MR. TIM WATKINS
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1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9905 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:40	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	<0.05	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.0	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.1	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.018	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24214-15
Report Date: 10/20/99

MR. TIM WATKINS
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1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9904 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:50	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.08	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	0.92	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.0	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.024	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24214-16
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9903 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:53	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.24	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	0.73	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.0	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.024	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

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INDUSTRIAL HYGIENE

Lab Number: DL24214-17
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9902 KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:55	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.08	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	0.92	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.0	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.027	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-18
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9901 KOONTZ LAKE / COE	Aqueous		21 SEP 99/15:00	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.07	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	0.89	---	mg/L	4500N		
Total Kjeldahl Nitrogen	0.96	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.024	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24214-19
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9910-B KOONTZ LAKE / COE	Aqueous		21 SEP 99/14:05	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Ammonia Nitrogen	0.05	0.05	mg/L	4500NH3-F	10-18-99	CE
Organic Nitrogen	1.1	---	mg/L	4500N		
Total Kjeldahl Nitrogen	1.2	0.10	mg/L	351.2	10-14-99	CTI
Total Phosphorous	0.021	0.005	mg/L	4500P-E	10-20-99	MB

* Reportable Detection Limit

Approved By
Scott Hayward
Production Manager

SEDIMENT ANALYTICAL RESULTS

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-1
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9901 KOONTZ LAKE / COE	Soil		20 SEP 99/14:20	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	500	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	16	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

Ohio EPA Drinking Water Certified
DEQ
USACE Certification
Wisconsin Department of Natural Resources
Ohio EPA VAP Certified

1120 May Street • Lansing, Michigan 48906-5599 • Telephone (517) 374-9656 • FAX (517) 374-6910
E-Mail: dlzlabs@dlzcorp.com

LABORATORIES, INC.
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ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-2
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9902 KOONTZ LAKE / COE	Soil		20 SEP 99/14:30	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	440	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	13	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-3
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9903 KOONTZ LAKE / COE	Soil		20 SEP 99/14:35	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	380	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	16	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-4
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9904 KOONTZ LAKE / COE	Soil		20 SEP 99/14:45	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	310	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	14	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-5
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9905 KOONTZ LAKE / COE	Soil		20 SEP 99/14:50	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	510	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	10	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-6
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9906 KOONTZ LAKE / COE	Soil		20 SEP 99/14:55	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	530	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	12	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-7
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9907 KOONTZ LAKE / COE	Soil		20 SEP 99/14:58	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	460	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	11	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

DLZ LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24215-8
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9908 KOONTZ LAKE / COE	Soil		20 SEP 99/15:00	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	190	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	45	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-9
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9909 KOONTZ LAKE / COE	Soil		20 SEP 99/15:05	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	26	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	80	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-10
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9910 KOONTZ LAKE / COE	Soil		20 SEP 99/15:07	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	820	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	9	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

LABORATORIES, INC.
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ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-11
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9911 KOONTZ LAKE / COE	Soil		20 SEP 99/15:20	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	460	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	12	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24215-14
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9914 KOONTZ LAKE / COE	Soil		20 SEP 99/15:36	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	490	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	13	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

LABORATORIES, INC.
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INDUSTRIAL HYGIENE

Lab Number: DL24215-15
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9915 KOONTZ LAKE / COE	Soil		20 SEP 99/15:41	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	450	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	10	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

LABORATORIES, INC.
A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-16
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9916 KOONTZ LAKE / COE	Soil		20 SEP 99/15:46	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	600	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	8	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

A DLZ Company
ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: DL24215-17
Report Date: 10/20/99

MR. TIM WATKINS
SNELL ENVIRONMENTAL GROUP
1120 MAY STREET
LANSING, MICHIGAN 48906

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
KL9917 KOONTZ LAKE / COE	Soil		20 SEP 99/15:50	23 SEP 99

CONSTITUENT	RESULT	*RDL	UNITS	METHOD	ANALYZED	BY
Total Phosphorous	170	0.50	mg/Kg	EPA/CE81-1	10-20-99	MB
Total Solids	26	---	%	2540G	10-04-99	RB

* Reportable Detection Limit

MEMORANDUM

TO: TIM WATKINS

FROM: ANN ST. AMAND

DATE: 10/5/1999

RE: ALGAL ANALYSIS

Please find enclosed, the algal analysis report and data file for Koontz Lake. The report is in MSWord format and the filename is J7099ARPT.DOC. The data set is in Excel format and the filename is J7099A1DAT.XLS. The memorandum is also in MSWord and the filename is tw100599.DOC.

Please note the concentration number is per liter and reflect the tow volume. If you have any questions, please contact us.

Thank You.

Algal Analysis
Provided for:
Snell Environmental Group, Inc.

Completed By:
PhycoTech, Inc.
620 Broad St., Ste. 100
St. Joseph, MI 49085
616-983-3654

Report File Hard Copy

Disk File is in MSWord Format
Filename: J7099ARPT.DOC

ALGAL SAMPLE ANALYSIS

Job: 70 Lake: Koontz Date: 09/21 Year: 99 Sample: n/a

Replicate #: 1 Station #: n/a Site: KL9910-2 Tow Volume (ml): 39

Depth: Pooled Epi. Level: None Fraction: None Calc. Type: Phyco-Net

990006-70 / 9941-5494-21 (0-20ft)

Code	Taxa	Division	Conc. Cell/L	Rel% Conc.
4900	*Cyanophyte (division leve*	Cyano	5.8E+005	92.0
7001	*Miscellaneous (division l*	Misc.	50456.9	8.0
	Totals.		6.3E+005	

ALGAL SAMPLE ANALYSIS

Job: 70 Lake: Koontz Date: 09/21 Year: 99 Sample: n/a

Replicate #: 1 Station #: n/a Site: KL9910-1 Tow Volume (ml): 51

Depth: Epilimnion Level: None Fraction: None Calc. Type: Phyco-Net

990005-70 / 9941-5494-21 (0-5ft)

Code	Taxa	Division	Conc. Cell/L	Rel% Conc.
4900	*Cyanophyte (division leve*	Cyano	1.2E+006	84.2
7001	*Miscellaneous (division l*	Misc.	2.2E+005	15.8
	Totals.		1.4E+006	

ALGAL SAMPLE ANALYSIS

Job: 70 Lake: Koontz Date: 09/21 Year: 99 Sample: n/a

Replicate #: 1 Station #: n/a Site: P1-2 Tow Volume (ml): 34

Depth: Epilimnion Level: None Fraction: None Calc. Type: Phyco-Net

990004-70 / 9941-5494-21 (0-5ft)

Code	Taxa	Division	Conc. Cell/L	Rel% Conc.
4900	*Cyanophyte (division leve*	Cyano	2.3E+006	86.8
7001	*Miscellaneous (division 1*	Misc.	3.5E+005	13.2
	Totals.		2.7E+006	

ALGAL SAMPLE ANALYSIS

Job: 70 Lake: Koontz Date: 09/21 Year: 99 Sample: n/a

Replicate #: 1 Station #: n/a Site: P1-1 Tow Volume (ml): 79

Depth: Epilimnion Level: None Fraction: None Calc. Type: Phyco-Net

990003-70 / 9941-5494-21 (0-5ft)

Code	Taxa	Division	Conc. Cell/L	Rel% Conc.
4900	*Cyanophyte (division leve*	Cyano	3.2E+006	95.5
7001	*Miscellaneous (division l*	Misc.	1.5E+005	4.5
	Totals.		3.4E+006	

ALGAL SAMPLE ANALYSIS

Job: 70 Lake: Koontz Date: 09/21 Year: 99 Sample: n/a

Replicate #: 1 Station #: n/a Site: KLTRAN5-2 Tow Volume (ml): 40

Depth: Epilimnion Level: None Fraction: None Calc. Type: Phyco-Net

990002-70 / 9941-5494-21 (0-5ft)

Code	Taxa	Division	Conc. Cell/L	Rel% Conc.
4900	*Cyanophyte (division leve*	Cyano	1.9E+006	92.8
7001	*Miscellaneous (division l*	Misc.	1.5E+005	7.2
	Totals.		2.0E+006	

ALGAL SAMPLE ANALYSIS

Job: 70 Lake: Koontz Date: 09/21 Year: 99 Sample: n/a

Replicate #: 1 Station #: n/a Site: KLTRAN5-1 Tow Volume (ml): 46

Depth: Epilimnion Level: None Fraction: None Calc. Type: Phyco-Net

990001-70 / 9941-5494-21 (0-5ft)

Code	Taxa	Division	Conc. Cell/L	Rel% Conc.
4900	*Cyanophyte (division leve*	Cyano	2.4E+006	94.9
7001	*Miscellaneous (division l*	Misc.	1.3E+005	5.1
	Totals.		2.5E+006	

Code	Taxa	Taxonomic Authority	Division
4900	*Cyanophyte (division level)*	n/a	Cyanophyte
7001	*Miscellaneous (division level) (excluding cyanophytes)*	n/a	Miscellaneous

Data File Hard Copy

Disk File is in Excel Format
Filename: J7099A1DAT.XLS

- Code format is as follows:
  * 1000 & 9000: Chrysophyta & Bacillariophyceae (Yellow-Greens, Golden-Browns, Diatoms)
  * 2000 & 8000: Chlorophyta (Greens)
  * 3000: Cryptophyta (Cryptomonads)
  * 4000: Cyanophyta (Blue-Greens)
  * 5000: Euglenophyta (Euglenoids)
  * 6000: Pyrrhophyta (Dinoflagellates)
  * 7000: Miscellaneous
  * Generally codes that end in "0" designate a genus

- Division format is as follows:
  C - Chlorophyta
  D - Pyrrhophyta
  R - Cryptophyta
  B - Cyanophyta
  T - Bacillariophyceae
  Y - Chrysophyta
  E - Euglenophyta
  . - (a period) Miscellaneous
  The miscellaneous category includes microflagellates, unidentifiable cysts, and Gonyostomum semen which is in the division Chloromonadophyta. This designation also includes other miscellaneous forms and divisions.

JOB	LAKE	MONTH/DAY	YEAR	SAMPLE TYPE	SITE	REPLICATE	DILUTION FACTOR	TOW VOLUME	DEPTH	DIVISION	TAXA CODE	CELLS PER COLONY	CONCENTRATION (CELLS/L)
70	Koontz	09/21	99	T	KL9910-2	1	0.56	39	PEPI	B	4900	11.725	581400
70	Koontz	09/21	99	T	KL9910-2	1	0.56	39	PEPI	.	7001	2.425	50456.87
70	Koontz	09/21	99	T	KL9910-1	1	2.96	51	EPI	B	4900	6.6	1187000
70	Koontz	09/21	99	T	KL9910-1	1	2.96	51	EPI	.	7001	2.455	222000
70	Koontz	09/21	99	T	P1-2	1	1.97	34	EPI	B	4900	11.85	2310000
70	Koontz	09/21	99	T	P1-2	1	1.97	34	EPI	.	7001	2.98	350600
70	Koontz	09/21	99	T	P1-1	1	4.58	79	EPI	B	4900	12.2	3201000
70	Koontz	09/21	99	T	P1-1	1	4.58	79	EPI	.	7001	1.31	152000
70	Koontz	09/21	99	T	KLTRAN5-2	1	2.32	40	EPI	B	4900	11.755	1894000
70	Koontz	09/21	99	T	KLTRAN5-2	1	2.32	40	EPI	.	7001	2.225	147000
70	Koontz	09/21	99	T	KLTRAN5-1	1	2.67	46	EPI	B	4900	9.73	2391000
70	Koontz	09/21	99	T	KLTRAN5-1	1	2.67	46	EPI	.	7001	2.25	127300

Zooplankton Analysis
Provided for:
Snell Environmental Group, Inc.

Completed By:
PhycoTech, Inc.
620 Broad St., Ste. 100
St. Joseph, MI 49085
616-983-3654

Data File Hard Copy

Disk File is in Excel Format
Filename: Z99000170.XLS
Z99000270.XLS
Z99000370.XLS
Z99000470.XLS
Z99000570.XLS
Z99000670.XLS

Koontz Lake Date: 9/21/99 Site: KLTRAN5-1 Tracking Code: 990001-70	
TOW(M)	1.5240
NETRAD(CM)	6.0000
VOLFILTERED(L)	17.2361
SAMPVOL(ML)	46.0000
ALIQ(ML)	5.0000
FACTOR1	9.2000
FACTOR2	0.5338
Nauplii	133.0000
Rotifers	126.0000
Cyclopoid	84.0000
Calanoid	1.0000
Cladocerans	8.0000
Nauplii	70.9906
Rotifers	67.2543
Cyclopoid	44.8362
Calanoid	0.5338
Cladocerans	4.2701
Total zoops (#/L)	**187.8850**

Koontz Lake Date: 9/21/99 Site: KLTRAN5-2 Tracking Code: 990002-70	
TOW(M)	1.5240
NETRAD(CM)	6.0000
VOLFILTERED(L)	17.2361
SAMPVOL(ML)	40.0000
ALIQ(ML)	5.0000
FACTOR1	8.0000
FACTOR2	0.4641
Nauplii	172.0000
Rotifers	154.0000
Cyclopoid	124.0000
Calanoid	6.0000
Cladocerans	4.0000
Nauplii	79.8326
Rotifers	71.4780
Cyclopoid	57.5537
Calanoid	2.7849
Cladocerans	1.8566
Total zoops (#/L)	**213.5057**

Koontz Lake Date: 9/21/99 Site: P1-1 Tracking Code: 990003-70	
TOW(M)	1.5240
NETRAD(CM)	6.0000
VOLFILTERED(L)	17.2361
SAMPVOL(ML)	79.0000
ALIQ(ML)	10.0000
FACTOR1	7.9000
FACTOR2	0.4583
Nauplii	188.0000
Rotifers	182.0000
Cyclopoid	58.0000
Calanoid	8.0000
Cladocerans	4.0000
Nauplii	86.1681
Rotifers	83.4181
Cyclopoid	26.5838
Calanoid	3.6667
Cladocerans	1.8334
Total zoops (#/L)	**201.6701**

Koontz Lake Date: 9/21/99 Site: P1-2 Tracking Code: 990004-70	
TOW(M)	1.5240
NETRAD(CM)	6.0000
VOLFILTERED(L)	17.2361
SAMPVOL(ML)	34.0000
ALIQ(ML)	5.0000
FACTOR1	6.8000
FACTOR2	0.3945
Nauplii	558.0000
Rotifers	304.0000
Cyclopoid	205.0000
Calanoid	54.0000
Cladocerans	0.0000
Nauplii	220.1429
Rotifers	119.9345
Cyclopoid	80.8769
Calanoid	21.3042
Cladocerans	0.0000
Total zoops (#/L)	**442.2585**

Koontz Lake Date: 9/21/99 Site: KL9910-1 Tracking Code: 990005-70	
TOW(M)	1.5240
NETRAD(CM)	6.0000
VOLFILTERED(L)	17.2361
SAMPVOL(ML)	51.0000
ALIQ(ML)	5.0000
FACTOR1	10.2000
FACTOR2	0.5918
Nauplii	163.0000
Rotifers	86.0000
Cyclopoid	94.0000
Calanoid	4.0000
Cladocerans	0.0000
Nauplii	96.4605
Rotifers	50.8933
Cyclopoid	55.6275
Calanoid	2.3671
Cladocerans	0.0000
Total zoops (#/L)	**205.3484**

Koontz Lake Date: 9/21/99 Site: KL9910-2 Tracking Code: 990006-70	
TOW(M)	6.0960
NETRAD(CM)	6.0000
VOLFILTERED(L)	68.9443
SAMPVOL(ML)	39.0000
ALIQ(ML)	5.0000
FACTOR1	7.8000
FACTOR2	0.1131
Nauplii	343.0000
Rotifers	385.0000
Cyclopoid	278.0000
Calanoid	19.0000
Cladocerans	16.0000
Nauplii	38.8052
Rotifers	43.5569
Cyclopoid	31.4515
Calanoid	2.1496
Cladocerans	1.8102
Total zoops (#/L)	**117.7733**